

What is claimed is:

1. A medicament dispenser, comprising:
a fluid medicament supply;
an ejector;
5 an accumulator in fluid communication with the ejector;
a valve in fluid communication with the fluid medicament supply and the accumulator;
a sensor configured to sense an accumulator characteristic; and
a controller configured to operate the valve in response to the accumulator
10 characteristic.
2. The dispenser of claim 1, where the sensor is configured to sense fluid pressure within the accumulator.
- 15 3. The dispenser of claim 1, where the sensor is configured to sense a volume defined by the accumulator
4. The dispenser of claim 1, wherein the sensor is fluidically coupled to the accumulator.
- 20 5. The dispenser of claim 4, wherein the sensor is configured to sense pressure adjacent the ejector.
6. The dispenser of claim 1, further comprising a compliant member
25 that regulates pressure within the accumulator.
7. The dispenser of claim 6, wherein the compliant member is configured to regulate pressure by deforming elastically in response to changes in accumulator pressure.

8. The dispenser of claim 7, wherein the compliant member is configured to regulate negative accumulator pressure.

5 9. The dispenser of claim 7, wherein the sensor is coupled to the compliant member to sense the accumulator volume.

10. The dispenser of claim 1, wherein the valve includes a microvalve.

10 11. The dispenser of claim 10, wherein the microvalve includes an electrostatic actuator, a magnetic actuator, or a piezoelectric actuator.

12. The dispenser of claim 1, further comprising a display configured to provide information to a user of the dispenser.

15 13. The dispenser of claim 12, wherein the information includes the number of doses of medicament remaining in the dispenser.

14. The dispenser of claim 12, wherein the information includes an indication to replace the fluid medicament supply.

20 15. A pressure regulator for a medicament inhaler having a fluid medicament supply and a fluid medicament accumulator, comprising:

a compliant member fluidically coupled to the medicament accumulator;

25 a valve that is in fluid communication with the fluid medicament supply and the medicament accumulator;

a sensor configured to sense a medicament pressure in the medicament accumulator; and

a controller configured to operate the valve in response to the medicament pressure.

16. The pressure regulator of claim 15, wherein the compliant member is configured to regulate a negative medicament pressure.

17. The pressure regulator of claim 16, wherein the compliant member
5 is a resilient member.

18. The pressure regulator of claim 15, wherein the controller is configured to operate the valve to increase the medicament pressure.

10 19. A method of dispensing a medicament, where the dispenser includes a fluid medicament supply and a medicament accumulator in fluid communication with the fluid medicament supply; the method comprising:
sensing a medicament pressure within the accumulator;
recharging the accumulator from the fluid medicament supply; and
15 ejecting medicament from the accumulator.

20. The method of claim 19, where recharging the accumulator includes opening a valve between the fluid medicament supply and the accumulator.

20 21. The method of claim 19, further comprising comparing the sensed pressure to a minimum acceptable medicament pressure within the accumulator.

22. A method of regulating medicament pressure in an inhaler, where the inhaler includes a fluid medicament supply and a medicament accumulator in
25 fluid communication with the fluid medicament supply; the method comprising:
sensing a first medicament pressure within the accumulator;
comparing the sensed pressure to a minimum pressure;
recharging the accumulator from the fluid medicament supply; and
sensing a second medicament pressure within the accumulator.

23. The method of claim 22, further comprising comparing the second pressure to a desired pressure.

24. The method of claim 22, where the second pressure is less than the
5 desired pressure, further comprising generating a notification that the fluid medicament supply should be renewed.

25. The method of claim 22, where recharging the accumulator relaxes
a compliant member that is fluidically coupled to the accumulator.

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26. The method of claim 22, where recharging the accumulator flexes a
compliant member that is fluidically coupled to the accumulator.

27. The method of claim 22, further comprising ejecting medicament
15 from the accumulator.

28. A method of making a medicament inhaler, comprising:
coupling a fluid medicament supply to a medicament accumulator with a
valve;

20 coupling a pressure sensor to the medicament accumulator; and
coupling a controller to the sensor and the valve, so that valve may be
operated in response to a sensed pressure.

29. The method of claim 28, further comprising fluidically coupling a
25 compliant member to the medicament accumulator.

30. The method of claim 28, wherein coupling the sensor to the medicament accumulator includes fluidically coupling the sensor to the medicament accumulator.

5 31. The method of claim 28, wherein coupling the sensor to the medicament accumulator includes mechanically coupling the sensor to the compliant member.

10 32. An inhaler, comprising:
a fluid medicament supply means;
an ejector means;
an accumulator means in fluid communication with the ejector means;
a valve means in fluid communication with the fluid medicament supply means and the accumulator means;
15 a sensing means configured to sense a characteristic of the accumulator means; and
a controller means configured to operate the valve means in response to the sensed accumulator characteristic.

20 33. The inhaler of claim 32, further comprising a compliant regulating means configured to regulate pressure within the accumulator means.